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D2BPS2203 (PAGES 2) Reg.No.....

Name: .....

SECOND SEMESTER B. Sc. DEGREE EXAMINATION, APRIL 2023
(Regular/Improvement/Supplementary)

PSYCHOLOGY

GPSY2B04T: REGRESSION ANALYSIS AND PROBABILITY THEORY

Time: 2 Hours **Marks Maximum: 60**

SECTION A: Answer the following questions. Each carries *two* marks.
(Ceiling 20 Marks)

1. Distinguish between positive and negative correlation.
2. Give any two properties of regression coefficients.
3. Give any two differences between correlation analysis and regression analysis.
4. Two variables gave the following data :
   $\bar{X} = 20$, $\bar{Y} = 15$, $\sigma_x = 4$, , $\sigma_y = 3$, $r = +0.7$
   Obtain regression equation of Y on X.
5. Define multiple correlation.
6. What are the applications of partial correlation?
7. Define coefficient of determination.
8. What is meant by sample space?
9. Define mutually exclusive events.
10. State addition theorem on probability for three events.
11. State the properties of pdf.
12. Define probability mass function.

SECTION B: Answer the following questions. Each carries *five* marks.
(Ceiling 30 Marks)

13. Calculate the coefficient of rank correlation from the following data :

X :	35	15	30	22	12	5	28	18	41	4
Y:	39	25	22	28	12	17	18	19	34	16

14. From the following table calculate the coefficient of correlation by Karl Pearson's method.

X	6	2	10	4	8
Y	9	11	5	8	7

15. The two regression equations are $3x - 2y + 1 = 0$ and $3x - 8y + 13 = 0$. Find the arithmetic mean, regression coefficients and correlation coefficient.

(PTO)

16. Compute partial correlation coefficients and multiple correlation coefficients for the following data. $r_{12} = 0.93, r_{13} = 0.94, r_{23}$=0.95.
17. What are the advantages of multiple regression?
18. A bag contains 7 white and 9 black balls. If three balls are drawn together from the bag, what is the probability that:
    (i) All are black. (ii) All are white.
    (iii) 1 white and 2 black. (iv) 2 white and 1 black.
19. Obtain the probability distribution of the number of 6's in 2 tosses of a die.

SECTION C: Answer any one question. Each carries *ten* marks.

20. Discuss the basics of probability distribution.
21. a) Define a random variable. Explain discrete and continuous random variables with suitable examples.
    b) From the following distribution function find the following probabilities.
    P(X=1), P(X=4) , $P(1 \leq X < 5)$, $P(X = 6)$, P(X>6) , $P(1 \leq X \leq 5)$

$$F(x)=\begin{cases} 0 & ; x < 0 \\ \frac{22}{63} & ; 0 \leq x < 1 \\ \frac{29}{63} & ; 1 \leq x < 2 \\ \frac{45}{63} & ; 2 \leq x < 5 \\ \frac{58}{63} & ; 5 \leq x < 7 \\ 1 & ; 7 \leq x \end{cases}$$

(1 x 10 = 10 Mark